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Preface

This special issue contains revised versions of five papers presented at the Sixth and Seventh Workshops on Language Descriptions, Tools, and Applications (LDTA 2006 and 2007). This workshop brought together academic and industrial researchers interested in the area of formal language descriptions and technologies and tools that make use of these descriptions. Several language specification formalisms like attribute grammars, action semantics, operational semantics, and algebraic approaches have strong theoretical underpinnings and supporting tools. These tools and techniques are commonly used for the analysis, transformation, and generation of computer programs or in the development of the language processing tools themselves. However, these techniques could be useful to a broader community and thus the workshop places a special emphasis on involving practitioners and in their feedback on the practical benefits (or hindrances) of language processing techniques and tools.

The papers presented in this special issue can all be viewed from this perspective and seen as addressing the usability of language processing tools and techniques. The first paper, "Automated generation of program translation and verification tools using annotated grammars" by Diego Ordóñez Camacho et al. describes how translators between related DSLs can be generated semi-automatically using grammars annotated with translation rules. Only the aspects of the translation that cannot be described by the rules must be handled by a hand-written translator. The work is evaluated with a set of real-world operations languages.

Two papers concerning attribute grammars follow. In "Implementation of a Modelica compiler using JastAdd attribute grammars", Johan Åkesson et al. present an extended case study. A key aspect of this work is a demonstration that design strategies for attribute grammar-based specifications are transferable between compilers for different source languages.

Eric Van Wyk et al. in "Silver: an extensible attribute grammar system" show how their system is based on a unifying design principle that views the attribute grammar specification language as a core surrounded by extensions that provide general purpose or domain-specific capabilities on top of the basic attribute grammar concepts. Extensions are achieved via previously developed concepts including attribute forwarding and higher-order collection attributes.

The final two papers concern parsing. There is increased interest in generalised parsing methods as the limits of traditional methods are reached, particularly when the grammars of different languages are combined. Elizabeth Scott and Adrian Johnstone continue their theoretical work on generalised parsing algorithms in "Recognition is not parsing—SPPF-style parsing from cubic recognisers" which combines Earley and RIGLR language recognisers with techniques developed to support the BRNGLR cubic-time bottom-up parser which returns all possible derivations using a modified shared–packed parse forest. The main thrust of this paper is in considering ways in which cubic-time bounds may be maintained when recogniser algorithms are extended to full parsers.

Ambiguity is a feature of many modern parsing methods. Sylvain Schmitz describes a conservative algorithm for identifying ambiguities in context-free grammars in "An experimental ambiguity detection tool". A tool incorporating the algorithm is evaluated on ambiguities that arise in the Standard ML grammar.

The guest editors of this special issue thank the authors for their efforts in submitting extended versions of their original papers. We are also appreciative of the efforts put in by the LDTA 2006 and 2007 program committees and the additional reviewers of these papers in preparing thoughtful and constructive reviews. We also thank the editorial board of Science of Computer Programming for supporting an issue of this journal devoted to the papers from these two workshops.

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